

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 9. This sheet replaces the original sheet including Fig. 9. In Fig. 9, the illustrated control unit is correctly designated by the element number 138.

Attachment: Replacement Sheet

REMARKS

Initially, Applicants wish to thank the Examiner for the detailed Office Action and for the Notice of References Cited. In addition, Applicants would also like to thank the Examiner for indicating acceptance of the Drawings in the outstanding Office Action. Applicants would also like to thank the Examiner for indicating consideration of each of the documents listed on the Forms PTO-1449 submitted with the Information Disclosure Statements filed on December 21, 2006; June 27, 2007; March 10, 2008; and May 29, 2008. Applicants note that the Examiner did not include a signed copy of the Form PTO-1449 submitted with the Information Disclosure Statement filed on December 11, 2008. Accordingly, Applicants respectfully request that the Examiner also indicate consideration of the Information Disclosure Statement filed on December 11, 2008 in the next Official communication.

Finally, Applicants would like to thank the Examiner for acknowledging consideration of Applicants claim for foreign priority as well as receipt of a certified copy of the document upon which Applicants' claim for foreign priority is based. However, Applicants note that the priority document was forwarded by the International Bureau and therefore, box 12(a)(3) should have been checked, and not box 12(a)(1). The Examiner is respectfully requested to check box 12(a)(3) in the next Official communication.

In the outstanding Official Action, the Drawings stand objected-to. Claim 16 stands rejected under 35 U.S.C. §112, second paragraph. Claim 18 stands rejected under 35 U.S.C. §101. Claims 1, 3-11 and 18 stand rejected under 35 U.S.C. §102(b) as being anticipated by AFSAR (U.S. Patent No. 6,401,193). Claims 12 and 14-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over AFSAR in view of alleged well known practices in the art. Claim 1, 3-4, 6 and 18 are also rejected under 35 U.S.C. §102(b) as being anticipated by

Japanese document HEI 11-167520 to SHINOZAKI. Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over AFSAR in view of Japanese document HEI 7-084879 to YAMADA and “well known practice in the art.”

Upon entry of the present amendment, claims 1 and 3-17 will have been amended, claim 18 will have been cancelled and new claim 19 will have been added. Support for the amendment to claim 1 and new claim 19 may be found at, for example paragraph [0061] and [0064] of the Application specification as filed. The amendments to claims 1 and 3-17, the cancellation of claim 18 and the addition of new claim 19 should not be considered an indication of Applicants’ acquiescence to any of the outstanding objection or rejections. Rather, Applicants have amended claims 1 and 3-17, cancelled claim 18 and added new claim 19 to advance prosecution and to obtain an early allowance of the present application.

Applicants traverse the objection to the Drawings. In this regard, a Replacement Sheet of Drawings including a revised Figure 9 is attached hereto, correctly designating the illustrated control unit with element number 138. In this manner, the Examiner’s concern will have been addressed. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objection to the Drawings.

Applicants traverse the 35 U.S.C. §112, second paragraph rejection of claim 16. In this regard, upon entry of the present amendment, claim 16 will have been amended to replace the recitation of “a change unit” with ---an updater---. Upon entry of the present amendment, claim 16 recites changing an access order of lines based on a selection by the selector. Accordingly, Applicants submit that the Examiner’s concern has been addressed. Therefore, reconsideration and withdrawal of the 35 U.S.C. §112, second paragraph rejection of claim 16 is requested.

Applicants traverse the 35 U.S.C. §101 rejection of claim 18. In this regard, claim 18 has been cancelled, rendering the rejection of this claim moot. Further, new claim 19 has been submitted for the Examiner's consideration and incorporates features substantially similar to features previously recited in now-cancelled claim 18. Claim 19 recites, *inter alia*, information being obtained from a processor. That is, new claim 19 is directed to a method that is tied to a machine (i.e., the claimed processor). In this manner, Applicants submit that the machine-or-transformation test is satisfied. Accordingly, reconsideration and withdrawal of the 35 U.S.C. §101 rejection of claim 18 is respectfully requested.

Applicants respectfully traverse the rejection of claims 1, 3-11 and 18 under 35 U.S.C. §102(b) as being anticipated by AFSAR. In this regard, AFSAR is directed to prefetching data using an instruction location indicator related to an upcoming instruction to identify a new data prefetch indicator. More particularly, the Examiner asserts column 6, lines 1-21 as teaching a condition generation information holder that holds information for generating a new condition, the information for generating the new condition being obtained from a processor, as recited in claim 1. Applicants submit that AFSAR merely discloses that a next data prefetch controller examines program instructions and uses selected instructions to build a data prefetch prediction table that is used to predict the next data prefetch. At most, the asserted portion of AFSAR may be considered to teach that the next data prefetch controller selection process involves examining an instruction line, preferably related to an executed instruction, for a particular characteristic. However, AFSAR does not teach or suggest that the information for generating the new condition is obtained from a process, as specified in Applicants' independent claim 1.

Applicants' independent claim 1 recites, *inter alia*, a judger that judges, using the condition held by said condition holder, whether a current state of the processor satisfies the

condition. In contrast, AFSAR discloses storing an “address difference” and prefetching or generating a prefetch table, based on an instruction sequence and prefetching based on the prefetch table. More particularly, an address difference is stored when the difference between a requested address and a stored address is equal to the “address difference”. The address differences and the prefetch table disclosed by AFSAR are not obtained from a processor and stored, as required by Applicants’ independent claim 1, but are merely automatically generated according to a fixed algorithm. The Examiner asserts column 8, lines 1-17 of AFSAR as teaching the above-noted features of Applicants’ independent claim 1. It is submitted that the asserted portion of AFSAR merely discloses generating a data prefetch prediction table. Further, AFSAR is submitted to disclose determining whether a current program counter from a processor matches a program counter tag of a data prefetch predication table. AFSAR does not disclose that a current state of the processor satisfies the condition, as recited in independent claim 1.

Further, Applicants’ independent claim 1 recites, *inter alia*, a manipulator that manipulates a cache according to the manipulation command held by the command holder using the address generated by said address generator when the judger judges that the condition is satisfied and an address generator generates an address to be manipulated. The asserted portion of AFSAR in column 8, lines 18-64 merely discloses obtaining prefetch data from a main memory and transferring the data to a cache, when a prefetch miss occurs and a refill manager is called upon to locate the prefetch data. That is, a processor constructed according to the teachings of AFSAR cannot and does not provide a manipulation command to the cache memory through an instruction.

According to a non-limiting embodiment of claim 1, a processor provides condition generation information and a manipulation command to a cache memory system, depending on the type and the progress of a currently executed operation. More particularly, once the condition generation information and the manipulation command are received from the processor, the cache memory system is able to execute cache manipulation independently without placing a processing load on the processor. In addition, the cache memory system is able to execute the cache manipulation necessary for the current operation of the processor, using the condition generation information and the manipulation command obtained from the processor.

The Examiner asserts column 7, lines 49-67 as teaching that a condition generator generates a new condition using the current state of the processor or the condition held by said condition holder and the information for generating the new condition held by said condition generation information holder, as recited in Applicants' independent claim 1. In this regard, AFSAR discloses that next data prefetch controller 76 selects executed instructions from the processor 52 that utilize deterministic addressing modes to generate effective addresses as the next data prefetch indicators. Further, AFSAR discloses that data prefetch prediction table entries as shown in FIG. 5 are generated from the executed instructions by carrying out the addressing mode function of instruction to calculate the effective address of the data that is predicted to be needed next by the processor. However, AFSAR does not teach or suggest a new condition, let alone generating a new condition using the current state of the processor or the condition held by the condition holder and the information for generating the new condition held by said condition generation information holder, as recited in Applicants' independent claim 1. Accordingly, Applicants respectfully submit that independent claim 1 is allowable over AFSAR at least for the reasons set forth above.

Moreover, the method of newly submitted independent claim 19 (which, as noted above, is based on cancelled claim 18) is submitted to be allowable for reasons similar to those noted with respect to independent claim 1, in addition to reasons related to its own recitations.

Applicants respectfully submit that each of dependent claims 3-17 are allowable at least because they depend, directly or indirectly, from independent claim 1, which Applicants submit has been shown to be allowable. Each of dependent claims 3-17 are also believed to recite further patentable subject matter. As such, allowance of the dependent claims is deemed proper for at least the same reasons noted for the independent claims upon which they depend, in addition to reasons related to their own recitations.

Accordingly, reconsideration and withdrawal of the 35 U.S.C. 102(b) rejection of claims 1, 3-11 and 18 as being anticipated by AFSAR is respectfully requested.

Applicants traverse the rejection of claims 12 and 14-17 under 35 U.S.C. 103(a) as being unpatentable over AFSAR in view of well known practices in the art, and the rejection of claim 13 under 35 U.S.C. §103(a) as being unpatentable over AFSAR in view of YAMADA and well known practice in the art. Each of claims 12-17 are submitted to be allowable at least insofar as each of the claims depends from independent claim 1, which Applicants submit has been shown to be allowable. Further, Applicants respectfully submit that YAMADA fails to disclose that which is submitted to be lacking in AFSAR. Accordingly, reconsideration and withdrawal of the 35 U.S.C. 103(a) rejection of claims 12 and 14-17 over AFSAR in view of well known practices in the art and the rejection of claim 13 under 35 U.S.C. §103(a) as being unpatentable over AFSAR in view of YAMADA and well known practice in the art is respectfully requested.

Applicants traverse the rejection of claims 1, 3-4, 6 and 18 under 35 U.S.C. §102 as being anticipated by SHINOZAKI. In this regard, the Examiner asserts paragraph [0034] of

SHINOZAKI as teaching a judger that judges whether a current state of the processor satisfies a condition and a condition generator that generates a new condition in the case where the judger judges that the condition is satisfied, as specified in Applicants' independent claim 1. However, paragraph [0034] of SHINOZAKI merely discloses generating a prefetch address based on a selected address difference. The Examiner asserts paragraph [0029] of SHINOZAKI as teaching a judger that judges whether a current state of the processor satisfies the condition. However, SHINOZAKI does not teach or suggest the current state of a processor, let alone that the current state of the processor satisfies a condition, as specified in Applicants' independent claim 1. Rather, paragraph [0029] of SHINOZAKI merely discloses a comparator 202 that outputs whether the output of a subtractor 240 is within the limits of address range 260.

Further, SHINOZAKI fails to disclose or suggest a manipulator that manipulates a cache according to the manipulation command held by the command holder using the address generated by the address generator when said judger judges that the condition is satisfied, as specified in Applicants' independent claim 1.

Moreover, the method of newly submitted independent claim 19 (which, as noted above, is based on cancelled claim 18) is submitted to be allowable for reasons similar to those noted above with respect to independent claim 1, in addition to reasons related to its own recitations.

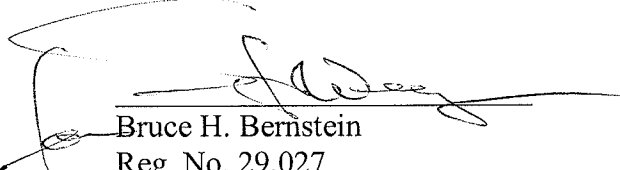
Applicants respectfully submit that each of dependent claims 3, 4 and 6 are allowable at least because they depend, directly or indirectly, from independent claim 1, which Applicants submit has been shown to be allowable. Each of dependent claims 3, 4 and 6 are also believed to recite further patentable subject matter. As such, allowance of the dependent claims is deemed proper for at least the same reasons noted for the independent claims upon which they depend, in addition to reasons related to their own recitations.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 3-4, 6 and 18 under 35 U.S.C. §102 as being anticipated by SHINOZAKI is respectfully requested.

At least in view of the herein contained amendments, remarks and Replacement Figure Applicants respectfully request reconsideration and withdrawal of each of the outstanding objection and rejections, together with an indication of the allowability of all pending claims, in due course. Such action is respectfully requested and is believed to be appropriate and proper.

Should the Examiner have any questions concerning this Response or the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,
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